

UNIFORM MODELING OF KEPLER OBJECTS OF INTEREST

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The central objective of this proposal is perform uniform state-of-the-art lightcurve modeling with Kepler's list of planetary candidates (Kepler Objects of Interest or KOIs) using tested and validated algorithms. This process includes modeling of planetary transits, phase curves and providing orbital solutions. We will use Kepler-photometry and other groundbased observables to determine key planetary parameters such as the radius and mass. More importantly, we will also determine posterior probability distributions for the fitted parameters by employing state-of-the-art Markov chain Monte Carlo algorithms. Our work will aid Kepler to determine the frequency of terrestrial and larger planets in or near the habitable zone of a wide variety of spectral types of stars by providing accurate stellar mass and radii and accurate planetary orbits and radii. As such, our work as contributes towards the determination of the distributions of sizes and orbital semi-major axes of these planets and provides an estimate the frequency of planets and orbital distribution of planets in multiple-stellar systems. This project also determines the distributions of semi-major axis, albedo, size, mass and density of short-period giant planets.